

ferred to *Peziza*, section *Humaria*; *A. Crechqueraultii*, Cr., also placed in *Humaria*; *A. Crouani*, Cooke, placed in the same section on account of its granular sporidia, but which, as indicated above, is only the immature condition, and, from its reticulated sporidia, should probably be placed in a new genus; *A. Guernisaci*, Cr., not placed, but excluded from *Ascoboli* on account of its non-prominent asci, &c.; *A. Brassicæ*, Cr., repndiated, owing to its granular sporidia, although they are violet-coloured; *A. microscopicus*, Cr., not placed; *A. coccineus*, Cr., referred, in part, to *Peziza convexula*, P.; *A. Leveillei*, Cr., a doubtful *Ryparobius*. *Peziza cunicularia*, Boud., will hereafter, as the author thinks, constitute a new genus. *Ascobolus trifolii*, Bivona, is united with *Phacidium*. *A. atrovirens*, Nees, is *Peziza atrovirens*, P. *A. Burcardia*, Martius, is *Bulgaria globosa*. *A. coronatus*, Schum., is *Phacidium coronatum*, Fr. *A. inquinans*, Nees, is *Bulgaria inquinans*, Fr. *A. rhizophorus*, Spr., is *Rhizina levigata*, Fr. *A. sarcoides*, Nees, is *Bulgaria sarcoides*, Fr. *A. testaceus*, Wallr., is *Peziza testacea*, Moug. *A. vitis*, Wallr., is *Peziza albo-violascens*, A. & S., and also *Cyphella Curreyi*, B. & Br.

Of the genus *Ascobolus*, as limited by M. Boudier, we have two new species, *A. Crouani*, Boud., and *A. Leveillei*, Boud.; of *Saccobolus* three—*S. violaceus*, Bond., *S. neglectus*, Boud., and *S. globulifer*, Bond.; of *Ryparobius* three—*R. brunneus*, Boud., *R. felinus*, Boud., and *R. dubius*, Boud.; of *Ascophanus* two—*A. minutissimus*, Boud., and *A. vicinus*, Boud.: in all, ten new species, which, added to those included by various authors in the old genus *Ascobolus*, bring up the number of species to forty-three, besides nine belonging to other genera, of some of which the true position has not yet been determined.

M. Boudier's figures are very faithful, so far as we are acquainted with the species described, and are carefully and artistically executed; and the whole paper is essential to all who wish to become acquainted with these plants. It is to be regretted that the author has not availed himself of the characters offered by the micrometer; we would notwithstanding recommend all those who take up mycology to procure the treatise without delay.

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#### MISCELLANEOUS.

*On the Genus Asterostoma, belonging to the Family Echinocorydæ.*  
By M. G. COTTEAU.

AMONG the very interesting fossils from the island of Cuba sent to Paris for the Exhibition of 1867, by MM. Fernandez de Castro and Jimeno Francisco of Matanzas, there were two species of Echinida belonging to the genus *Asterostoma*, Agassiz. These Echinida, which are very remarkable for their form and the totality of their characters, thanks to the kindness of M. Jimeno, to whom they belonged, now form part of my collection; and I have been able, by examining

them at leisure, to complete the diagnosis of the genus and determine the place which this curious type should occupy in the series.

Before the Exhibition of 1867, only a single specimen of *Asterostoma*, from Lamarck's collection, was known. In 1847 MM. Agassiz and Desor, in the 'Catalogue raisonné des Echinides,' had made of this unique specimen the type of the genus *Asterostoma*, and given the species the name of *eccentricum*. Although noticing that this genus approaches *Echinocorys* (*Ananchytes*, Lamk.) and that the anterior ambulacral area is formed of smaller pores than the paired ambulacral areas, MM. Agassiz and Desor place the genus *Asterostoma* at the end of the family Cassidulidæ, not far from *Conoclypeus*. In 1865 D'Orbigny described the genus *Asterostoma* and the only species which it then contained. Because the anterior ambulacral area differed from the others, not only in its form but also in the structure of its pores, the author of the 'Paléontologie Française,' justly considering this organic character very important, thought that the genus must be placed among the Spatangidæ, in which, as is well known, the anterior ambulacral area is never like the others.

Some years later, M. Desor, in the 'Synopsis des Echinides fossiles,' had again to turn his attention to *Asterostoma*. That eminent naturalist discusses and combats the opinion of D'Orbigny: the position of the peristome, which is almost central in *Asterostoma*, the strongly marked furrows which surround it, and of which no trace exists in the true Spatangidæ, and the structure of the apical apparatus, which, from the impression left at the apex of the ambulacral areas, appeared to affect an elongated form, led M. Desor to remove the genus *Asterostoma* from the Spatangidæ; and it appeared to him much more natural to unite it with the Galeritidæ, near *Desorella* and *Pachyclypeus*, which, as he says, combine with a central and angular peristome an elongated apical apparatus.

The two new species of *Asterostoma* which I have just studied, from the fine preservation of some of their essential organs (the paired and anterior ambulacral areas, the peristome, the apical apparatus, &c.), whilst enabling me to complete the diagnosis of the genus, leave me in no doubt as to the place which it should occupy; and I have no hesitation in ranging it in the family of the Echinocorydæ, between *Stenonia* and *Holaster*. That important character upon which D'Orbigny dwelt, namely the difference of structure between the anterior ambulacral area and the others, is still more apparent and marked in our two new species. It is not only the ambulacral pores that are smaller and otherwise arranged in the anterior ambulacral area; the poriferous plates themselves are higher and consequently much less numerous; and this clearly marked difference gives to the upper surface a physiognomy which is certainly not that of the Echinobrissidæ and Echinocoidæ. M. Desor, to support his opinion, especially invoked the almost central position of the peristome and the deep furrows which converge into it. In the new *Asterostomas* from Cuba, the peristome is much more excentric in front, the ambulacral furrows which surround it, although still

present, are less apparent and not so much produced, and the lower surface, in its general aspect, presents much resemblance to that of *Holaster* and *Echinocorys*. The apical apparatus is perfectly preserved in one of our species (*A. cubensis*); it is not elongated, as M. Desor supposed, but compact and subcircular.

To sum up. The genus *Asterostoma*, by its general characters, the anterior ambulacral area different from the others, the subpetaloid paired ambulacral areas, the transverse peristome, which is most frequently very excentric in front, and the rounded periprocta, situated on the posterior surface above the ambitus, takes its place in the family of the Echinocorydeæ; its compact apical apparatus, furnished behind with an angular complementary plate, which penetrates to the centre of the apparatus, seems to approximate it to the true Spatangidæ; but it must not be forgotten that if *Echinocorys*, *Holaster*, and *Cardiaster* have an elongated apical apparatus, there is also among the Echinocorydeæ the genus *Stenonia* which, although very nearly allied to *Echinocorys*, has nevertheless a compact and subcircular apical apparatus.

The genus *Asterostoma* includes three species, which, although presenting numerous points of resemblance, are nevertheless perfectly distinct:—

*Asterostoma excentricum*, Agassiz.

— *Jimenoï*, Cotteau.

— *cubensis*, Cotteau.

We do not know positively the deposit from which the species of *Asterostoma* are obtained. The specimen in the Paris Museum bears no indication of locality; it is penetrated by a hard, compact, greyish limestone, which, according to D'Orbigny, indicates a bed older than the Tertiary formation, and may be Cretaceous. The specimens collected in Cuba by M. Jimeno are also derived from a hard, greyish rock; but this petrographic character is certainly not sufficient to refer them to the Cretaceous formation. Zoological characters furnish more conclusive arguments. The family Echinocorydeæ, in which I have placed *Asterostoma*, has hitherto included only exclusively Cretaceous genera; and, on the other hand, the genus *Asterostoma*, considered in itself, departs in its general characters from all the Tertiary or living types that we know. It may, therefore, probably belong to the Cretaceous formation; but these are only presumptions, and to obtain more certainty we must wait for the stratigraphical information for which I have asked M. Jimeno.—*Comptes Rendus*, February 7, 1870, tome lxx. pp. 271–273.

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